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## ARTICLE VIII.

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# ON LEPSIUS'S STANDARD ALPHABET:

A LETTER OF EXPLANATIONS FROM PROF. LEPSIUS,

WITH NOTES BY W. D. WHITNEY.

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Presented to the Society May 18th, 1864.

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[THE seventh volume of the Society's Journal contains (pp. 299-332) a somewhat detailed analysis and criticism of the first edition of Prof. Lepsius's Standard Alphabet (Berlin and London, 1855), by Prof. Whitney. In reply, the distinguished proposer of the alphabet, on occasion of the publication of a second edition of his work (1863), addressed a letter of explanations to Prof. Whitney, and expressed his desire that it, or the substance of it, should be brought before the Society and published, as the criticism itself had been. It was accordingly presented at the Society's next meeting by Prof. Whitney, along with verbal comments of his own, which he has now, by request, written out to accompany it.—COMM. OF PUBL.]

..... Upon reviewing the more general characteristics of the proposed "Standard Alphabet," and the special modes of representation and selected signs to which your approval is expressly given, I perceive that there remain, in fact, only a few exceptional cases, in regard to which we have still to come to an understanding. You hold, as was to be expected, to the Italian and German value of the vowel-signs, which has not become altogether unknown even in English orthography. You accept, with us, as sign of a long vowel the horizontal mark above the letter, instead of the circumflex accent, and, as sign of a short vowel, the crescent line (˘). It is of more consequence, that you also favor the Greek circumflex (ˆ) over the vowel as sign of nasality, instead of the appended *n* with a diacritic point, as has hitherto been more usual, to the total misapprehension of the true quality of the nasalized vowel. Further, you retain the acute (´) as sign of accent, while it has not seldom been misemployed to indicate the long quantity of a vowel. Also, you regard the double dots with *o* and *u* as the best mode of marking the sounds of German *ö* and *ü*, but are disposed to question whether they might not also be placed, as

in German, over the vowel.<sup>1</sup> The chief obstacle to this method comes from the Tataric languages, in which both vowels are common, and often have to be provided both with the sign of long quantity and with that of accent, which would cause a too great accumulation of signs above the vowel ( $\ddot{u}$ ,  $\acute{u}$ ): in such cases, of course, the dot above the  $i$  is left off. Besides, in writing and printing, the double  $ii$  and the  $\ddot{u}$  are often hard to tell apart, and this might easily make trouble in foreign languages.

I must add a remark to what you say on pages 309 and 331 respecting the vowel of the English *but*, and respecting the so-called "neutral vowel," which you would rather write  $\alpha$  than  $\epsilon$ . Here you seem to me to treat two different vowels as one. The former, in *but*, *son*, *does*, is a clear vowel, like all the others, and lies in our system precisely between  $a$  and  $\bar{o}$  (Standard Alphabet, 2d ed., p. 50). The latter is produced by the unarticulated resonance of the vocal chords, which, even when the mouth is closed, may be made audible through the nose, or through both passages together, and is found in all languages, chiefly in unaccented syllables—the same which, in the Sanskrit and other languages, when combined with  $r$  and  $l$ , turns them into vowels, and can also enter into combination in such a way with all sonant fricatives as to confer upon them vocalic value in forming syllables. In English it is always without accent, as the  $o$  in *nation*, the  $a$  in *beggar*, the second  $e$  in *velvet*. If we provisionally write the vowel of *but* with the sign  $\phi$ , then the closely kindred vowels  $\phi$ ,  $\xi$ ,  $\epsilon$  are easily to be distinguished in *puns*, *pence*, *threepence*, or in *but*, *wet*, *carpet*.<sup>2</sup> Since, however, it is not our spe-

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<sup>1</sup> The suggestion to which reference is here made did not imply any serious dissent from Prof. Lepsius's opinion touching the representation of these sounds, but was only to the effect that, for convenience's sake, the letters dotted above might not be wholly disallowed. The principle that the diacritical marks should be placed below the letters, in order to leave room above them for the designation of more accidental qualities, is evidently to be accepted as sound and valuable.

<sup>2</sup> Here, I cannot forbear insisting upon the correctness of my own view, and claiming that Prof. Lepsius—so far as concerns English orthoepy—is endeavoring to separate into two sounds what in fact is only one. The neutral vowel, in my apprehension, is that utterance of intonated breath through the mouth upon which the shaping organs of the mouth are prevented from exerting any voluntary influence, in the production of which they remain quiescent and idle, as in the natural process of breathing. Hence the appositeness of its appellation. In  $\alpha$  (of *far*) there is equally an absence of shaping agency on the part of the mouth organs; only here, instead of being lazily left in the way, to dim the utterance, they are consciously got out of the way, by the full opening of the mouth. Hence  $\alpha$  and the neutral vowel are nearest of

cial object to transliterate the English, and since the series in the vowel-pyramid (St. Alph., 2d ed., p. 52) which stands nearest to *a* is not developed in any other language, so far as I know, as clearly and consciously distinct from the next following series, I have regarded it as proper to indicate the single sounds of the

kindred; the latter is the dimmed or indistinct counterpart of the former; it is well entitled by the Hindu grammarians "the covered-up (*saṁvṛta*) *a*." I greatly question whether it is proper to call it "unarticulated," as is done by Prof. Lepsius; but this is a verbal question, which need not delay us now. The same uncharacterized utterance of intonated breath not only *may* enter into combination with all sonant fricatives, but there can be no such thing as a sonant fricative without it. It does not by its presence turn *r* and *l* in Sanskrit into vowels, because it is necessarily inherent in the *r* and *l*, whether they be consonants or vowels. It constitutes, now, a striking peculiarity of our English vowel-system—one accordant with the dimming which so many of our open vowel-sounds have been made to undergo, and with the general reduction of the vowels in our unaccented syllables to insignificance and indistinctness—that, in a host of words, even the accented vowel has lost its distinctive quality, and sunk to the condition of the neutral. The vowel-sound in *but*, *son*, *blood*, *touch*, *does* is absolutely the samewith that in the final syllables of *nation*, *pilfer*, *ocean*, *nadir*, *zephyr*. (Prof. Lepsius treats *carpet* and *velvet* as belonging in the same category with these latter words; but he is in error: the *e* of their final syllables has its ordinary short sound; there is no difference except of accent between the *vel* and the *vet* of *velvet*.) The *o* of *son* differs from that of *nation* only as the *a* of *tact* differs from that of *contact*, the *e* of *pet* from that of *carpet*, the *u* of *full* from that of *fearful*. In this view, I am sure, I shall be supported by the very great majority of those to whom the English language is native.

Nor am I able to perceive that there is any especially close kindred between the vowel-sound in *but* and *puns* and that in *wet* and *pence*; as would seem to be inferrible from Prof. Lepsius's chosen examples. *But* and *wet* are no nearer than *but* and *fat*, or *but* and *hot*, or *but* and *put*, or *but* and *fit*.

I should hardly be willing to allow any place at all in the vowel-pyramid to the neutral vowel, the sound of *u* in *but* etc. Its more proper position would seem to be outside, in the other direction from the apex *a*, since it differs from this sound by another sort of difference than that which characterizes the other vowel-sounds. We place *ū* between *i* and *u* because in its utterance are combined the characteristic positions of those two vowels; we place *ö* between *e* and *o* for a like reason. But I cannot see that the *u* of *but* sustains any such relation to the *a* of *at* and the *a* of *all*, or to any other pair of vowels in the system. It is most nearly related to the *g*-sounds (German *ö*, French *eu*), but the reason is, I think, that these latter, by their combination of the medial labial position of *o* with the medial linguo-palatal position of *e*, approximate pretty nearly to that general condition of quiescence of the mouth-organs in which the neutral vowel is produced.

English series, even where they sporadically show themselves also in other languages (as in Mordwin, etc.), with the signs of the next following series, and, accordingly, not to distinguish the two series. For this principle, also—namely, to observe moderation in the distinction of sounds—I have your express approbation (pp. 309, 329). The sound *o*, too, which is so clearly distinguished in French (*beurre, heurter, un*) from *ô* (*feu, jeune*), I have found developed along with the latter in no other language outside of Europe; in German, where *o* is only long, *ô* only short, the sign *o* would be sufficient for both. But in no case is the sound *ô* an invention of mine, made for the sake of theoretic completeness. If, again, you look upon my distinction of *e* and *ē*, along with *e*, and of *o* and *ô*, along with *o*, as unfounded or dubious, your view rests, as I think, only upon a misunderstanding of my employment of these signs. The distinction of the open and of the close long *ē* (*ē* and *ē̄*) is not developed in the English language, which possesses only *ē̄*; only, among its short vowels, it has *ă*, in *hat, fancy*, along with *ē̄*, in *men, send*, which last appears to be somewhat nearer to *ē̄*, if compared with the German *ē̄*, in *Männer, senden*. It is true that the short vowels *ē̄* and *ē̄* are hard to distinguish; but in southern Germany, in the Swabian dialect, even these are regularly held apart; every one speaks *fett* with *ē̄*, and *Bett* with *ē̄*, *bellen* with *ē̄*, and *Stelle* with *ē̄*. But, when of long quantity, *ē̄* and *ē̄* are sharply distinguished in French, German, and numerous other languages, in and out of Europe; as also (though not in German), *ô* and *ô̄*.<sup>3</sup> In obedience, however, to our rule (p. 79),

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<sup>3</sup> I fully acknowledge the greatly superior authority of Prof. Lepsius in reference to such details as are here treated of, and do not venture to criticize or question his statements, except when they concern our own English sounds; here, I feel that a native utterance which is fully self-conscious confers an equal or paramount right. As a rule, all the English long vowels differ from the corresponding short ones by being of somewhat closer position, and there may doubtless be this difference also between the *e* of *met* and the initial sound of the *e* of *they*, so that, in Prof. Lepsius's system, the latter would be more exactly written with *ē̄*, the former with *ē̄*. But, as is well known to English phonologists, and pointed out in many of the works on the subject, our English "long *a*" (the *e* of *they* etc.) is not a simple vowel-sound, but a slide; it begins with *e* and runs down to *i*, just as our "long *o*" begins with *o* and runs down to *u*: each has, as it is often termed, a "vanishing sound," the one of *i* (*ee*), the other of *u* (*oo*); this Prof. Lepsius leaves out of sight. To my ear—as, I presume, to other English ears—there is a more noticeable difference of quality between the *i* of *hit* and the *i* of *pique*, or between the *ū* of *full* and the *ū* of *fool*, than between the opener and closer *e* in either French or German. But Prof.

to avoid as much as possible unnecessary diacritical signs, we write, in every language, either only *e*, *o*, or only *e*, *o*, since their distinction is obvious; and farther, we write with diacritical sign that one of the two sounds which occurs least frequently; the other we leave without sign (as plain *e*, *o*)—unless, indeed, there should be special reasons for employing marks of distinction in both cases. Hence, in Ossetic (p. 138), we oppose *e* (for *e*) and *e*; and in Lithuanian, *e* and *e* (for *e*). Where the distinction is not developed at all, only the neutral *e*, of course, calls for use, whether the sound actually lies between *e* and *e*, or approaches more nearly to one or the other of them.<sup>4</sup> It is of importance, at all events, that you expressly (p. 306) give your assent to the use of the subterposed line and point for indicating the open and the close sounds respectively; and after the above explanation respecting the shifting application of these signs, I think that I may feel certain of your assent with respect to this point also. The same exposition furnishes an answer, too, to your remark (p. 310) respecting *oi* (for *oi*) in English *join*, and *ẽ* (for *ẽ*) in French *bien*, since there is not, in the former language, any *oi* along with *oi*, nor, in the latter, any *ẽ* along with *ẽ*.<sup>5</sup>

You take especial exception to my comparison of the vowels

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Lepsius passes over these differences as unessential; nor should I think of setting the English vowels referred to on different steps of the vowel-pyramid. But neither should I, if an intermediate step is to be established between *e* and *a*, think of occupying it with the French or German opener *e*, which Prof. Lepsius writes with *e*. This belongs on the same step with *e*, as being but a slightly varied form of the latter; the independent position must be reserved for the English *a* in *fat*, which is a true medial between *a* and *e*, as is the *a* of *all* between *a* and *o*.

I propose to give, in an additional note, a brief systematic view of the English vowel-sounds.

<sup>4</sup> This principle of Prof. Lepsius's system—namely, to leave the normal and usual vowel of each language unencumbered by diacritical points, introducing these only according to the inner needs of the language itself—must command general and hearty approval.

<sup>5</sup> The difficulty suggested by Prof. Lepsius's usage as to the points here referred to is not wholly removed by his explanation. If, in writing the simple sounds, we are to distinguish the *o* of *old* and the *o* of *or* carefully by appropriate signs, why, when the latter occurs in diphthongal combination, shall we represent it by the sign of the former? If the vowel-sound nasalized by the French in *lin* is much more nearly akin with the *a* of *malade* than with the *i* of *lignè*, why write it with the sign of the latter? The question here is not one regarding the introduction of new signs, which would otherwise be unnecessary; it concerns the consistent application of those which are actually adopted and used: and, without this, no phonetic system of transcription can be approved.

with the colors. I give up this comparison (which is found in the new edition also, at p. 46) wholly to your criticism. It has no real concrete value, and I have made no manner of application of it. It appeared to me, however, quite well calculated to make clear to the reader why I abandoned the earlier universally accepted and altogether confusing arrangement of the vowels in a single series, with which even the physiologists were wont formerly to vex themselves, and adopted in its stead a new pyramidal arrangement, which, though less agreeable to the eye, is very important for the understanding. The simple and very apposite analogy of the triangle of colors saved me any further explanation of my arrangement, with those readers who were not so familiar with its physiological foundation as I myself could not but be.<sup>6</sup> I know, too, very well where the comparison is defective, as appears plainly from my arrangement of the vowels in those languages which show the harmonic sequence of vowels. So much by way of explanation, and in order to free myself from the reproach of a fanciful theory, which is so abhorrent to me that I should be sorry to bear even the appearance of it. At present, the triangular arrangement has become usual. You yourself employ it, and you even extend the legs of the triangle into the system of consonants. The complete separation of vowels and consonants seems to you unnecessary and not strictly justifiable. A statement of the reasons on account of which I cannot agree with you in this, as well from a theoretical as a practical point of view, would here lead me too far,<sup>7</sup> as I only wish now to call up the points bearing upon the transcription of the sounds, in which we agree or still differ, or in which I think that I note a misapprehension of my view, admitting of ready removal.

On page 311, you find my explanation unsatisfactory, when I

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<sup>6</sup> The regrettable effect of Prof. Lepsius's introduction of the comparison between the vowels and the colors lay, to my apprehension, chiefly in its seemingly implied denial of any real substantial ground for his arrangement of the vowels. The natural inquiry was: If there is a physiological reason for the vowel-pyramid, why is it not given us instead of this? And the triangle of colors, it is to be presumed, was hardly, if at all, more familiar to our author's readers than that which it was brought in to illustrate. It is much to be regretted that our expostulation, or that of some one else, did not reach Prof. Lepsius in time to prevent its insertion in his second edition.

<sup>7</sup> I am very sorry that Prof. Lepsius abstains from any exposition of his views upon this point, the most interesting and important one of a theoretical character, it seems to me, among those discussed in my previous essay. I propose to devote a second additional note to a more thorough and detailed examination of the question.

say that *r* and *l* "are formed by a contact which is vibrating in *r*, and partial in *l*:" since, you maintain, the English *r* does not always vibrate, and "partial contact" is unintelligible. Now, in the English *r*, the vibration in many cases is in fact almost wholly lost, but it is only worn down from a former condition of distinctness, and some slight remnant of it is still left, else one would be compelled to say that *r* had passed over into another sound: the state of the case is the same as in regard to the French "*l mouillé*," which has become almost precisely *y*. Vibration remains still the characteristic sign of a well-marked *r*.<sup>8</sup> The "partial contact" of *l*, on the other hand, I understand

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<sup>8</sup> This is, in one aspect, a merely verbal question, as to whether a sound formed in a certain way shall or shall not be styled an *r*; yet it also involves a real one—namely, what constitutes the essential character of an *r*.

That a definition of *r* which takes note only of a vibratory quality in it, without specifying the organ which vibrates and the part of the mouth where the vibration takes place, is an imperfect and unsatisfactory one, must, certainly, be granted by everybody. In order that we may understand what such a sound is, we must at least be told that it is produced between the tip of the tongue and the roof of the mouth, as is actually the case. To me, now, this description of its place and organ of production (its *sthāna* and *karana*, as the Hindu grammarians would say) constitutes its true definition; the vibration is a common, even a usual, accessory circumstance; but it may also fail without impairing the essential quality of the sound, or taking away its right to be deemed an *r*. The comparison which Prof. Lepsius makes with the French *l mouillé* does not hold good throughout. The fundamental characteristic of an *l* is that, in its utterance, the intoned breath is expelled at the side of the tongue, which is in contact with the roof of the mouth at its middle: so long as this condition is fulfilled, so long as there is closure at the point and exit at the sides of the tongue, so long is the sound produced an *l*, and nothing else—whether the tip of the tongue be far retracted in the mouth, to the "cerebral" position, so as to form the "cerebral *l*" of the Vedic dialect of Sanskrit, or whether the whole tongue be drawn back into the position of palatal contact, so as to produce a palatal *l*, the true *l mouillé*. As soon, however, as the central contact in this last *l* is broken, and the breath escapes over the middle of the tongue, the *l* is lost, and the *y* takes its place, as is in fact the case in the latest style of French pronunciation. There has been a substitution of one sound for another. But nothing of this kind is true of the *r*. When, in its pronunciation, the tip of the tongue is directed forward, near the teeth, a vigorous articulation readily and naturally sets the organ in vibration, and such vibration is, perhaps, in the great majority of cases, an accompaniment of the utterance of this letter. But the vibration may be wholly eliminated, even during utterance in the position described, and yet the sound will continue to be so palpably of the same quality that no one would think of calling it any-

in this way, that the tip of the tongue is in contact, and that, at the same time, its sides are not in contact, but permit the exit of the breath, as in semivowels and fricatives: consequently, *l* is only partially explosive; the other part is semi-vocalic, or, as in the Welsh *ll*, fricative.<sup>9</sup>

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thing but an *r*. The production of this untrilled *r* may be carried as far back in the mouth as we choose, but, though it will change its tone a little, as does the *l* in a similar case, it will continue to be an unmistakable *r*; and no one, that I am aware, has ever attempted to give it any other name. We sometimes hear persons who have a constitutional inability to utter an *r*, and substitute for it a *w*; but it would be very unjust, I think, to deny to those individuals and communities who do not trill the *r* the credit of pronouncing it at all. The vibration depends partly upon the force of utterance, partly upon the point on the roof of the mouth where the sound is produced. If the tip of the tongue be brought fairly back within the dome of the palate, vibration is impossible. This is the position in which the ordinary English *r* is uttered; and the same, as we have good reason to believe, was the case with the Sanskrit *r*. Its classification by the Hindu grammarians along with the other "cerebral" letters, its evident relationship with them as shown by its euphonic effects, and the absence of any notice of the peculiar quality of vibration as belonging to it, are quite conclusive upon the point. Unless, then, we are ready to deny to the Sanskrit as well as to the English the possession of an *r*, we must not set up vibration as the fundamental and essential characteristic of that letter.

As regards the trilling of the *r*, the differences of usage are not only national, but local, individual; they even depend upon circumstances affecting the style of utterance of the same speaker. The French trill with notably greater force and distinctness than do the Germans; a vibration is hardly to be accounted as the invariable accompaniment of this letter in a good German pronunciation, although it must be more distinctly spoken in German than in ordinary English. Among the English-speaking community, the Hibernians are most renowned for the rich roll they give their *r*; but the same is also a frequently remarked characteristic of individuals, and is often heard in public speaking, when great distinctness is aimed at, or the orotund quality affected.

I should define the *r*, then, as the sonant uttered between the tip of the tongue and the roof of the mouth, at the degree of opening next greater than that by which the sibilants are produced; and the vibration as its accidental, though usual, accompaniment, a characteristic of only secondary value.

<sup>9</sup> Prof. Lepsius has here given a definition of the *l* to which I should not have thought of taking exception; and he had already done so elsewhere, as was remarked in a note to my former essay (p. 312). It is to be regretted that he has not taken the trouble to do the same thing in his account of the Standard Alphabet, since the expression "partial contact" is so indefinite and ambiguous as not to be understood without explanation.

At page 313, you disapprove of my designation of "strong" and "soft" consonants, and are willing to admit only such appellations as "intonated and unintonated," or "vocal and aspirate," or "sonant and surd." That I was not perfectly clear as to what I myself would wish to express by these designations, I may now, doubtless, safely deny; since, in your note (on p. 315), you yourself cite my essay on the sounds of the Arabic alphabet, where I have set forth my view respecting the physiological processes in more detail. Until that time, as it seems to me, no one had yet given a precise definition of what characterizes the *tenuis* (as it is pronounced quite regularly in central Germany, in Hungary, etc., and was without doubt also pronounced in Sanskrit), in contradistinction from the *aspirata* (which must not be confounded with the fricative), and from the *media*.<sup>10</sup> You enter, in your note, only into the distinction of sonant and surd, without separating *tenuis* and *aspirata*. Respecting that distinction, so far as I can see, we are altogether agreed. I, like yourself, regard the intonation as the "primary

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<sup>10</sup> The wholly new and very peculiar views expressed by Prof. Lepsius in the paper in question respecting the distinction of *tenuis* and *aspirata* have not yet, so far as I am aware, met the assent of any other inquirer in the same department, nor can I think them at all likely to win general acceptance. He maintains that, for example, the English, French, and ordinary German *k*, *t*, *p* are not *tenuis*, simple surd mutes, but *aspirata*, aspirates. He does not know, he says, how a more decidedly aspirated quality can be imparted to any mutes than we give to these. The only people in modern Europe whom he will admit to pronounce them as actual *tenuis* are the Saxons and their like in central Germany, and the Hungarians. Now it is certain that the English, missionaries and others, who go among peoples having alphabets that contain aspirate letters—for example, in India—have never found any difficulty in distinguishing these aspirates from their own *tenuis*, as they have supposed them to be; and that we, on our part, when they return to us, find no difficulty in apprehending the same difference as exemplified in their pronunciation. The characteristic of an aspirated mute, according to the ordinary opinion—from which I do not understand Prof. Lepsius actually to dissent—lies in this: that a bit of audible breath is interposed between the breach of mute closure, the "explosion," and the following vowel. If our author can discern any such inserted aspiration after our *k*, *t*, and *p*, he must be endowed with a most exceptional keenness of ear. I believe, on the contrary, that, when we utter *pa*, the unclosure of the lips and the commencement of the vowel sound are so absolutely coincident that no blade more substantial than a purely hypothetical one can in any wise be inserted between them. The peculiar *tenuis* of the Saxons and Hungarians, it is moreover to be noticed, are quite otherwise explained by Dr. Brücke (Ueber eine neue Methode der phonetischen Transscription, Wien, 1863, p. 10 [230]), as combining a closure of the larynx itself with that of the mouth-organs.

distinction" between surd and sonant, and treat the force of breath, which alone remains behind in whispering, as dependent upon the other, and of secondary value. If, however, I still speak of "strong" and "soft," it is merely a translation of the expressions *fortis* and *lenis*, which have become everywhere conventionally usual. It is often of advantage to employ conventional designations, the meaning of which is known to every one. Just as conventionally usual, but in their literal meaning yet more inaccurate, are the terms *media*, *tenuis*, *guttural*, *palatal*, *lingual*, *dental*, even *cerebral*, and so on. To this is to be added, that the terms "strong" and "soft" of themselves denote the relation quite correctly, and even, if we take into account the whispering voice, more correctly than "surd" and "sonant," of which the former, taken literally, would even be unsuitable. Yet more inaccurate would be "vocal" and "aspirate," since "vocal" is used of the voice in general, and "aspirate" would exclude the *tenuis*. But I am ready to approve any expression which finds conventional assent, and is used in accordance with its strict definition; and especially, I willingly accept of the terms surd and sonant, derived from the Sanskrit grammarians.<sup>11</sup>

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<sup>11</sup> I rejoice at being authorized henceforth to reckon Prof. Lepsius among those phonetists who regard utterance with intonated breath as constituting the fundamental character of a *v* as compared with an *f*, a *b* as compared with a *p*, and so on, and who deem the expulsion of a greater or less amount of breath in the two cases respectively a matter wholly secondary and subsidiary. I did not understand him as taking that ground in his Standard Alphabet, or even in his paper on the transcription of the Arabic; if I failed fully to apprehend his meaning, I am very glad to acknowledge my error. That this doctrine will be accepted by all the phonologists of the next generation does not, in my view, admit of doubt, and it is a marvel to find men (like Max Müller, in his last lectures about language) who still cling to the old view that a *z*, for instance, differs from an *s* primarily by inferior force of utterance. In the fact that there are such persons, that opinion is not yet a unit upon the subject, lies the objection to the terms "strong" and "soft." If all were agreed as to the true nature of the distinction, these terms would be quite innocent; it would be comparatively a matter of indifference how the two classes were entitled: as the case stands, any one who employs them seems to sanction and adopt the wrong theory.

Nor can I assent to Prof. Lepsius's claim that, in any case or in any circumstances, the words "strong" and "soft" denote the relations of the two classes of sounds correctly, or more correctly than "surd" and "sonant" or their equivalents. They imply a difference in the effort of utterance, which does not, so far as I can see, have any existence. That more breath is actually expended in the production of an *s* or *f* than of a *z* or *v* may be true, but it can be true only because, in uttering the

What you say of the dentals—that they are often uttered behind the teeth, not upon the teeth—is quite right: in German, and probably in most languages, the place of contact is some-

latter sounds, the vocal cords are approximated for the purpose of vibration, thus narrowing the aperture through which the breath escapes. If the same is true in whispering, it is for a like reason; here, the vibration is replaced by a tension and approximation of the cords to a somewhat inferior degree. The difference of expenditure is a mere consequence; it is no voluntary act, of which the consciousness takes cognizance. If a distinction of “strong” and “soft” is to be founded on such a difference, then our ordinary sonorous utterance is “soft,” and all whispering is “strong”—and the more feeble and indistinct it is (from insufficient tension of the cords), so much the “stronger” must it be; then *v* is a “strong” letter as compared with *p*, since it admits an expulsion of breath which the latter forbids; nay, even *b* is a “stronger” letter than *p*, for, in producing it, intonated breath is forced up into the closed cavity of the mouth before the breach of labial contact, which is not the case with *p*.

Once more, I altogether fail to see that this estimate of the comparative quality of *p* and *b* ignores the relation, to these or to one another, of the aspirates *ph* and *bh*, or that the two things have anything to do with one another. On the contrary, I am compelled to confess that Prof. Lepsius's elaborate discussion of the relation of *media*, *tenuis*, and *aspirata*, in his paper on the Arabic alphabet (pp. 105–109), appears to me to throw no new and valuable light upon the subject. So far as I can see, it is an attempt to force the distinction of these three classes of sounds into a dependence upon the force of utterance, the expenditure of breath, whereas the connection of the two is secondary and accidental merely. How the case is with regard to *media* and *tenuis*, sonant and surd, we have already sufficiently seen. But we have also already seen that the essence of an aspirate, as distinguished from either *media* or *tenuis*, lies in this: that it offers a perceptible interval of unintonated breath between the breach of mute closure and the following vowel or other sound. Whenever a bit of an *h*, however brief, is distinctly heard between a *p* or a *b* and a following *a*, for instance, the syllable becomes a *pha* or *bha*, instead of *pa* or *ba*. An aspirate is, not an intensification of anything, but a succession of two diverse elements; it has a temporal, not a dynamical value. Now it is indeed possible, in the phonetic history of a language, that a dynamic element may undergo translation into a temporal, and *vice versâ*; an intensified utterance may lead to the aspiration of a mute, a relaxed utterance may reduce an aspirated to a simple mute, whether *media* or *tenuis*: but so also may a vowel become lengthened where a consonant is dropped, a consonant be doubled to compensate the shortening of a vowel, and the like. The one case, like the other, is only accidental and occasional; there is no necessity in any such conversion. A *tenuis*, a *media*, or an *aspirata*—either of the three—admits the most energetic pronunciation which our organs can give it, or may be produced with utter abnegation of effort—both without any modification of its essential character. Were

what variable; it, however, certainly includes the teeth themselves: that is to say, their posterior surface.<sup>12</sup> Also respecting *ś* (English *sh*), I quite agree with you: the sound is produced by a cavity whose posterior entrance lies near the palatal point, and may be formed with either the middle or the extremity of the tongue (in the latter case the sound is "cerebral"); the anterior exit lies at the teeth, which are very essential in producing the rushing quality: it can therefore be regarded either as palatal (or cerebral) or as dental, and would most accurately be styled palato-dental, just as the Semitic "emphatic" (lingual) letters are properly gutturo-dental.<sup>13</sup> Probably, however, the use of the term "dental" will not give way, and we shall be obliged to reconcile ourselves to it.

Instead of *ś* or *ṣ*, you would rather (p. 318) see *ś* or *ṣ* written, without, however, laying any great stress upon the point. You yourself accept *ś* as palatal sign, and regard the sound as that of the Sanskrit palatal sibilant (ऌ). It is difficult to establish firmly any of the differing views respecting this Sanskrit sound: and for this reason, as well as others, I think that the independent sign *ś* deserves the preference.

In the new edition, as you perceive, I have complied with the wish expressed by yourself and many others, and have used for

this not so, we should be ever shifting our mutes from class to class, as circumstances or our change of mood called forth in us a greater or less energy of enunciation.

I can, therefore, only repeat my former comparison, and say that to condition the definition of *tenuis*, *aspirata*, and *media* in any manner on force of utterance is equivalent to conditioning the definition of man, woman, and child on their respective degrees of physical vigor.

<sup>12</sup> Here, again, I cannot help insisting on the opinion advanced in my former paper, that the teeth themselves play no part in the production of our so-called "dental" letters, *t*, *d*, etc. Even when, in their utterance, the tongue touches the posterior surface of the teeth, the determining contact is made upon the gums behind them. The teeth are not close enough to stop altogether the passage of the breath, and form a mute closure: if the tip of the tongue touches them alone, enough air must slip out to convert the mute into a spirant, the *t* into a *θ*.

<sup>13</sup> Once more, I regret having to differ in opinion with Prof. Lepsius. I cannot possibly convince myself that the teeth have anything to do with producing the *sh*-sound, or conferring upon it any portion of its quality. In our ordinary palatal utterance of it, the tip of the tongue may be crowded away from the teeth with an instrument, without affecting the sound; and when it is pronounced, as Prof. Lepsius expressly allows that it may be, with the tongue turned back into the "cerebral" position (as the Sanskrit ऌ is produced), how can the teeth possibly take part in the process?

the Sanskrit languages the bases *c* and *j*, instead of *tš* and *dž*, for the English sounds of *ch* and *j*. But the addition of the sign *˘* above them (*č*, *ĵ*), as in *š* and *ž*, appears to me altogether to be recommended, since *c* before *a*, *o*, and *u* is sounded *k* even in English and Italian, and in all other European tongues both *c* and *j* have, in all situations, values very different from those which we should thus assign to them. To this is to be added, that the employment of *j* without the sign (as a light *y*) for the Slavonic languages cannot possibly be avoided. Hence I am glad that you are willing after all to allow the additional sign, which will, I am sure, prove itself more and more clearly indispensable.<sup>14</sup> You say (on p. 321) that I am unfaithful to my own principle, viz., that such characters are to be excluded from use as have too greatly varying a pronunciation in the principal European languages, like *c*, *j*, *x*. From the examples which you adduce, one would, indeed, be able to put to use but few of the letters of our Latin alphabet. But I spoke only of those respecting which the general linguistic use is still unsettled, which is not any longer the case with the vowels, nor with *w*, *y*, *v*, *z*, *q*, but is so with *c*, *j*, and *x*. This is therefore still the principal reason why I regard the writing of *č*, *ĵ*, *x* as important, or even indispensable. I say this merely to guard against a charge of inconsistency, since you give your express assent to the signs I have selected.

As concerns, further, my strict separation of the explosives and fricatives in the choice of bases: you regard this as so much the less necessary, because most fricatives are etymologically developed from explosives. I set out from the fact that, in the history of phonetic development, this very transition into fricatives is, of all others, the most important and characteristic, which usually most thoroughly alters the phonetic relations of a language, and carries with it many secondary changes. It is more important than the mutation of *media* and *tenuis*, which, however, everywhere have independent bases; we do not find it necessary to express in the written alphabet phonetic laws like those by which, in German, every final *media* is pronounced

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<sup>14</sup> I am not prepared to admit as altogether conclusive with regard to the usage of the Standard Alphabet these considerations drawn from the customs of the modern European nations. If I am not mistaken, it would soon be found by one who should make practical use of the Alphabet that he was wasting ink and effort in writing a diacritical sign over characters which needed no such addition, because they were used by him in no other value, and he would inevitably begin to leave it off. The decision might safely enough be left to practice.

The use of *j* in the Slavonic alphabets to express a *y*-sound seems a regrettable violation of consistency in the system.

as *tenuis*: but it would seem intolerable to pronounce the **same** letter now *p*, now *f*, or now *t*, now *s*. The method, hitherto so usual, of writing *kh* for *χ*, and *th* for *θ*, has already caused the most inextricable confusion; even in the Greek and Latin grammar, and yet more in that of other languages, it has absolutely obscured and withdrawn from notice the simple ideas which we have to connect with the term aspirate, on the one hand, and spirant, or fricative, on the other: many people do not even yet know that the Greek *χ*, *φ*, *θ*, if pronounced in the modern manner, as fricatives (viz., *φ* as *f*, and so on), are no longer *adspirate*, but *spiratæ* or *spirantes*, or *fricativæ*. In the Siamese language, therefore, we meet (see St. Alph., p. 238) with no fewer than five different *kh*'s, four *ch*'s, and six *th*'s; and, by reason of the scanty means we possess of informing ourselves respecting this language, it would have been absolutely impossible, without a key, luckily discovered, to reduce to order such an orthographical chaos. As regards the sound *χ* or *kh*, the further difficulty comes in, that it is wanting in English and French, and that those who speak these languages have therefore always looked upon the difference between *k* and *χ* as less than that between *t* and *s*, or *p* and *f*. With a sufficiently general transition of explosive into fricative sounds commences a new period of life, in a phonetic point of view, not only for the single sounds, but also for the whole language. The mutations of *media*, *tenuis*, and *aspirata* always go on in a circle; if, however, any one of them, usually an aspirate, has passed over into a spirant, it can never recover an explosive character. Hence the importance, to the linguist, of keeping constantly before his mind the point of development of the sounds, whether explosive or fricative, by means of the use of different bases in representing them; and so much the more, when etymological relationship favors their confusion. For the aspirates, you approve (on p. 332) *kh*, *gh*, *th*, *dh*, also *sh* and *zh*, and naturally also *ph* and *bh*. The separate representation in this way of the aspiration I have likewise favored in the new edition of my work. For the fricatives, however, you would prefer *k'*, *g'*, *t'*, *d'*;<sup>15</sup> con-

<sup>15</sup> Prof. Lepsius does not appear fully to understand the intent of the remarks to which he here refers. I was inquiring what would be admissible substitutes for the signs of the Standard Alphabet where these were not to be had, or, for special practical reasons, should not be adopted. It was not my design to counsel absolutely the employment of the signs marked with the rough breathing for the spirants, and the signs with following *h* for the aspirates; I was not, in fact, taking the latter class of sounds into account at all: but I regarded either style of signs, for the sibilant and spirant sounds, as better for practical use than other more far-fetched representatives which some might be inclined to devise.

sequently, *p'* should be used for *f*, and *b'* for *v*, if one is to be consistent; but you would retain *f* and *v*, after all, because there actually are Latin characters for them. Since, now, *k*, *g*, *t*, *d*, *p'*, and *b'* have long been used by Bopp and his school for the aspirates (and, on account of the Devanagari, I even yet prefer them for the strict transliteration of ancient Sanskrit), I fear that this admission would lead to still further complications; moreover, the rough breathing has acquired universal value as sign of a guttural aspiration, which is not present in *z*, *θ*, *f*, or can only follow them as a separate element (*f<sup>h</sup>* for *flh*). For the same reason, I have now wholly abandoned *θ'*, *θ*, *z'*, *z* for *θ*, *δ*, *z*, *γ*, and have eventually gained your approbation (p. 322) for so doing. To employ the superfluous *x* for *z* has, in truth, always been very enticing, but the general feeling, according to my experience, is too strongly against it to allow of its acceptance. Besides, there would then still be needed a sign for *γ*, which we should no longer have any means of providing.<sup>16</sup>

You question (on p. 326) the desirableness of setting up a "faucal" class, having its place of production in the larynx itself.<sup>17</sup> For the languages related with the Sanskrit, indeed, it has little importance, although the Indian grammarians themselves hint at such a place of production, when some of them [see Ath. V. Prâtichākhyā, i. 19, note, in this Journal, vol. vii., p. 351] give to *a* and the *visarga* the name *urasya*, 'pectoral.' But the class has its real significance in the Semitic languages. The Arabian grammarians know very exactly the place of formation

<sup>16</sup> No one will be inclined to question the general soundness of the theoretical views proposed by Prof. Lepsius in this exposition. What opinions will necessarily differ upon, however, is this: how far, in setting up an alphabet, considerations of practical convenience shall be subordinated to those of theoretical consistency, or the contrary. I should at all points, I suspect, be inclined to give a little more weight to the former than Prof. Lepsius allows them. If we must find expression for the almost infinite variety of articulate sounds from the scanty resources of the Latin alphabet, with a little aid from the Greek, there is no Latin letter which ought not to be pressed into the service. If *w* can be adopted into the Standard Alphabet with a value which it has in no prominent European language excepting the English, it would take no great stretch of the same charity to bring in *x* also.

<sup>17</sup> My objection was not so much to the setting up of a class of sounds having their place of production lower than the ordinary gutturals, as to our author's mode of constructing the class, his definition of its sounds, and his declaring it parallel with such a series as *f*, *v*, *p*, *b*. This parallelism I now understand Prof. Lepsius himself to abandon a little farther on, when he pronounces the *alif* not the sonant counterpart of the *ain*, while he has fully granted above that intonation constitutes the essential distinction of *v* from *f*.

of the faucals, ʕ, ʔ, *h'*, and *h*, as altogether different from that of the gutturals. The professional physiologists, too, especially Brücke, fully accept it. Only the name is still a subject of controversy: "laryngal" has been recently proposed, and with this I too should be perfectly satisfied. As regards the assimilation of the *h* to the following sound, of which you speak, I understand the process in this manner: that the characteristic place of production is always the larynx, but that the emission or the checking of the breath takes place in the position of the following or of the preceding sound, and so in very varying relations of the mouth organs.<sup>18</sup> Respecting the lightest explosive sound, also, which I write ʔ, the linguistic physiologists are in accordance: in the Semitic languages it appears as a full and universally audible consonant. It is indeed true, as you claim, that the utterance of a ʔ before an initial vowel can be avoided, if one does not close before it the already opened throat; but usually it is uttered, and the usual practice has caused it to be written.<sup>19</sup> The Indian *α* does not, indeed, admit of direct identification with the Semitic *alif*; I have therefore preferred to

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<sup>18</sup> This statement is not altogether satisfactory, in my opinion. A vowel, as every one holds, is a sound produced in any one of a large number of different positions of the mouth-organs, with the vocal cords in the larynx in a state of sonant vibration: its "characteristic place of production" is not the larynx, but the modifying organs of the mouth, and from these it gets its descriptive name. An *h*, now, is also a sound which is produced in any one of these same positions of the mouth-organs, but with the vocal cords in the larynx only slightly approached, even less than in whispering a vowel. Why, then, shall we pronounce the larynx the "characteristic place of production" of *h*, any more than of the vowels, as spoken aloud or whispered? Why call *h* "laryngal," and not the vowels also? I cannot but continue to hold that *h* finds its best position in the alphabet as corresponding surd to all those classes of sounds which do not have each its own special surd.

<sup>19</sup> It is doubtless necessary, in transliterating the Semitic alphabets, to take some account of this element. What I protested against, and still protest against, is the undue enhancement of its consideration, by adopting it into the general alphabet as a consonant, entitled to rank with the other consonants. What separates it from these is that it lacks a positive value as an element of spoken speech; it is not audible. The aperture of the throat, if it be not already open, requires unclosure before the utterance of a vowel; so the aperture of the lips, if it be not already open, requires unclosure before the utterance of any consonant which is not a labial mute; the former unclosure is capable of being exaggerated until it becomes perceptible to the ear which is watching for it close at hand; so also is the latter: the one is, in my view, just as much entitled as the other to consideration in the general theory of sounds, and to representation in the alphabet.

strike out my reference to it (see p. 68, and compare p. 314). To the sound of ' the designation "soft" is applicable, but not "sonant:" it is only weaker than *ain*, not intonated.

Most of the preceding remarks are merely intended for the further explanation and justification of those of my views and proposals—put forward in the Standard Alphabet, but only briefly or not at all confirmed by detailed reasonings—to which you have taken exception. You object only in a few points to the mode of transcription, and this is, as regards the practical object of the work, which is also its chief object, the important matter. The second edition in this respect accords decidedly more nearly with your views; and I may therefore hope with so much the more confidence for your further approval, on which I lay great value.<sup>20</sup> . . . .

Berlin, October 18th, 1863.

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<sup>20</sup> In these notes—as also, to a less degree, in my former essay—I have entered more fully into discussion of theoretical points, touching the mode of production and the classification of sounds, than into a consideration of the signs to be adopted for them. This last is a matter of individual preference, and affords a field for the widest diversities of choice. It can only be settled by a conventional assent to some one's proposals, by a submission to the claims of some system which comes backed by such authority as gives it a fair prospect of making its way to general acceptance. Prof. Lepsius's Standard Alphabet has seemed to me to possess more of that authority than belonged to any other system, while it is at the same time marked by the learning and good sense which are needed to justify its adoption. I heartily wish it the successful career to which, in my view, it is justly entitled by its merits.

The second edition of Prof. Lepsius's work differs from the first comparatively little in the introductory or theoretical part, but is vastly extended beyond its predecessor in the practical part, the application of the proposed alphabet to the actual transliteration of languages already written, or to the expression of languages heretofore without an alphabet. Considerably more than a hundred different tongues, of the most various locality and character—Asiatic, African, European, and American; living and dead; literary, illiterate, and hitherto unwritten—are here submitted to phonetic analysis and description, and are supplied with modes of writing based on the Standard Alphabet. The author's great and many-sided learning, his industry in collection and perseverance in research, his acuteness of ear and ingenuity of explanation, as exhibited in this immense work, cannot but meet the full and grateful acknowledgment even of those who may be not altogether satisfied with the system of signs adopted, or incredulous as to the feasibility of a general alphabet.

## ADDITIONAL NOTES.

1. *On the English Vowel-System.*

Prof. Lepsius has devoted a few pages of the second edition of his *Standard Alphabet* (p. 49 sq.) to a succinct account of the vowel-system of the English language. As, however, notwithstanding its general correctness, I am unable to accept in all points his analysis and descriptions, I have felt impelled to take up the subject here, and to give my own views of it. I am far from entertaining the belief that I can explain all its difficulties, or lay down an authoritative scheme which shall be accepted by standard English speakers everywhere. Owing in no small measure, doubtless, to the insufficiency of English orthography, and its impotence as a means of fixing pronunciation and restraining its variations, there are in our language local and even individual peculiarities of utterance as regards the lighter shades of vowel-sound, to a degree, I should think, beyond what prevails in other tongues among cultivated speakers. To this cause is in part due the non-agreement of English phonologists, though in greater part to more subjective reasons. Final accordance must be the result of many men's labors; and I shall be glad to have contributed my mite toward an issue so desirable.

Our open or "Italian" *a* (in *ah! far, heart, aunt*), in the comparatively small number of words in which we have retained it, is the same sound which the letter *a* and its correspondents prevailingly have in other languages, ancient and modern, and which the sign was devised to designate.

The first modification of this sound which we have to notice on the palatal side is our "short *a*," or "flat *a*," as found in *hat, axe*, etc. It is a true medium between *a* and *e*. There is nothing at all nearly approaching it in German; both the German and the French open sounds of *e* stand decidedly more remote from it than from the normal *e*. The present Parisian pronunciation of *a*, as in *malade, patte, sac*, is almost the same with it, but, I should say, somewhat less flat, more open and accordant with *a* proper; differing from the English sounds as much as, for example, the French *ê* in *tête* from *é* in *thé*. There is therefore no propriety in representing the *a* of *hat* by the sign for an opener *e*; Prof. Lepsius's proposal, of an *a* with a subscript *e*, or *a*, is a very suitable one.

It is claimed by some that the *a* of a considerable class of words, *graft, grasp, dance*, and their like, the pronunciation of which has only recently, and not yet universally, been flattened from the pure *a*, is less removed from the latter than is the *a* of *hat*, and constitutes an intermediate term between the two. I do not venture to speak with certainty upon this point, being one of those who have retained the full ancient *a* in all such words, and in whose mouth, accordingly, the new sound is not native or natural. Whether a real medium between *a* and *a* is going to establish itself as a permanent member of our vowel-system, the future only can determine; but I should hardly think it likely.

Our mention of the *e*-sounds may begin with our common "short *e*" (in *met, head, said*, etc.), respecting the relation of which to the short *e* of other tongues, see the remarks of Prof. Lepsius above (p. 338).

The most nearly corresponding long sound, which goes with us by the name of "long *a*" (in *mate, great, vail, they*, etc.), is chiefly distinguished from this in quality, as remarked in a former note (p. 338), by being a slide: it begins with an *e*, and runs down to an *i*. To compare the quality of its initial element with that of the short *e* is therefore not easy, since one is very liable, if he prolongs it in order to examine it more closely, to unwittingly distort it a little. If difference there be between them, it is excessively slight, and of no practical account as compared with the distinction of the two sounds as simple vowel and as slide. If any one chooses to maintain that the beginning of *ē* is closer than *ē*, I should not care to dispute him: such is, in general, the relation between our corresponding long and short vowels.

It is fairly a matter of question whether we are not called upon to admit the existence of a third *e*-sound, before *r*, in such words as *there, their, care*. Upon this point also I am compelled to speak with diffidence, inasmuch as I belong to the party, not insignificant in numbers on either side of the water, but declared heterodox by the orthoëpists, who in all the words of this class speak the flat *a* (*a*). An *e* in such a position certainly seems to possess some points of difference from either of the other two: it is unlike our long *e* (*they*) in lacking the vanishing sound of *i* which belongs to the latter; and yet it cannot be reckoned a short *e*, because its conjunction with the following *r* produces an effect which elsewhere only appears in connection with our long vowels and diphthongs, and which is called out by all these excepting *a*, *a*, and *ē*: examples are *care, hear, oar, poor, fire, sour*. As regards this whole class of cases, I am far from content with the explanation which is given by Prof. Lepsius, following the authority of more than one English orthoëpist. He teaches, namely (p. 50), that the *r* itself is converted into a guttural vowel, analogous with the Sanskrit vowel *ṛ*, and forms a diphthong with the preceding vowel. Now, in the first place, no vowel *ṛ* in Sanskrit is ever conjoined with another vowel, either before or after it, nor can I conceive that the *r* should ever be cognizable as a vowel in such a position.\* In the second place, I can find no trace whatever in my own throat of a guttural quality in the *r* of these or any other words, and I can hear none in the throats of those about me. It cannot well be doubted that such an utterance appears in some mouths, else we should not meet with its description; but to treat it as a general feature of English pronunciation is certainly wrong; I should incline to regard it as dialectic rather than English. In my view, the second vowel sound, compounded with the principal one of the syllable, is no other than the neutral vowel, in the form which it is accustomed to assume before an *r*, as in *fur, her, sir*, etc.: a bit of this is slipped in before the smooth *r*, which, then, is either uttered in the usual slight and inconspicuous manner, or, in the practice of some, may be replaced by a guttural vibration, or, once more, is omitted entirely, as is the very common usage with careless and easy speakers: certainly a large portion of English speakers absolutely silence every *r* which is not fol-

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\* For a fuller discussion of the quality and occurrence of *r* as a vowel, see the next note.

lowed by a vowel; the inserted transitional vowel, in the words under discussion, takes its place. The word *care*, then, is properly to be written, after the initial guttural mute, with an *e*, followed by the neutral vowel, and, after the latter, the *r*: it contains four distinct phonetic elements. And whether the *e*-sound is precisely accordant in quality with the *e* of *met*, or (as seems to me more probable) of a slightly superior openness, is at least a question of no practical consequence; nor would, in any case, a separate sign be required for its representation.

The extreme pair of vowels on this side are the *i* of *hit* and the *i* of *pique*, or, as we are accustomed to call them, "short *i*" and "long *e*." These differ from one another not in quantity alone, but also, and to no insignificant degree, in quality: and, as elsewhere in our vowel-system, the short vowel is the more open one. Dr. Brücke (*Grundzüge der Physiologie und Systematik der Sprachlaute*, p. 23) calls our short *i* in *hit*, as well as the vowels of *not*, *full*, and *but*, "imperfectly formed." But I am unable to see any good reason for the designation, either in theory or in fact. The very name "imperfect vowel" seems a contradiction in terms. If a vowel is a simple and homogeneous tone—that is to say, if it is a vowel and not a diphthong or a slide—it is an utterance through a single determinate position of the organs of the mouth and throat; and who shall assume to pronounce one position of these organs less "complete" than another? It might, indeed, possibly be claimed that a certain position is transitional and transient only, incapable of being maintained; but such a claim will be found, upon examination, destitute of any real foundation. Our organs of articulation can assume no position which they are not also capable of continuing, provided we control them aright. The difficulty lies only in the directing mind: we are so in the habit of touching the short vowel briefly and lightly, and of protracting the nearly kindred long vowel, that when we try to dwell upon the former, we are apt to slide into the latter. So also, hardly any one, having struck a musical note, can strike another a quarter of a tone above or below it in pitch, not because either of the two is easier or harder to sound than the other, but because the conception is occupied with the first, and is unable to form so distinct an idea of the second as to hold the organs to the work of its production. And, in point of fact, these short English vowels are, in singing, found and proved protractable: no English ear can fail to detect in a moment the performer who, in singing *ī* to a long note, puts an *ī* in place of it. The French has no such sound as our *ī* in *hit*; every French *i*, long or short, has precisely the same quality, and the matter is one which he who has to teach French pronunciation to English pupils finds occasion to insist upon often and strongly; but I do not see how the possession of a short *i* differing from the long—even if, perhaps, differing to a less degree than ours—can be denied to the German.

Upon the other side of the vowel-system, the first place is taken by the "broad *a*" of *all*, *haul*, *ought*, *broad*, etc., which is, as Prof. Lepsius truly describes it, opener and nearer to *a* than any *o*-sound in French or Italian; and, while these last admit of representation by a diacritically distinguished *o*, it must be written with a sign which denotes it as a medium between *a* and *o*: on the side of theory, there can be no ob-

jection to Prof. Lepsius's proposal, an *a* with subscript *o*—thus, *a*. Our "short *o*," in *hot*, *what*, etc., is usually regarded as its corresponding short vowel; but not with entire accuracy, for it is a decidedly opener sound. This, indeed, as has already been remarked, is a general characteristic of our short vowels, as compared with their long counterparts: but it seems to my ear that there is more difference of quality between the vowel sounds in *what* and *all* than between those in *hit* and *pique*, or in *full* and *fool*, or in *hut* and *hurt*. The *a* of *what*, in my opinion, is fully as near to the *a* of *far* as to that of *all*, and might not less suitably be written as corresponding short to the former than to the latter. To represent it by *ǎ* is no impropriety, provided it be at the same time described and well understood as medial in quality between *q* and *a*.

Our "long *o*" (in *tow*, *vote*, *boat*, etc.) slides down to *u*, in the same manner as *ē* (in *they*) to *i*: and with the same exception—namely, that before *r* (in *door*, *pour*, etc.) it replaces the vanishing sound of *u* with a bit of the neutral vowel: and this time, I believe, there is no room for the suspicion that an opener quality is imparted to the *o* itself. The proper short *o*, strangely enough, is altogether wanting in accented syllables in English, save as it is found in the local pronunciation of a few words, such as *home*, *whole*, *stone*. Such pronunciation is quite common in New England, although, so far as I know, hardly any two individuals agree precisely in the list of words of which they shorten the vowel. How extensively it may prevail in other portions of the English-speaking community, has not come to light: but, however the orthoëpists may reject it, a phonologist can hardly help feeling tempted to encourage a tendency which would remove so striking an anomaly as the lack of a short *o* from the vowel-system of our language.

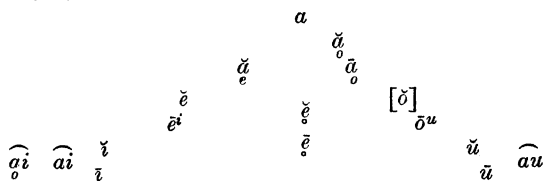
The difference between our short *u* in *full* and the corresponding long *u* in *rule*, *fool*, etc., is precisely similar, in kind and degree, to that between the *ī* of *hit* and the *î* of *pique*, as already described.

Our "long *u*," as every one knows, is no simple vowel, but a syllable, composed of a semivowel and vowel; it is as distinctly *yu* as if it were so written. After *r*, however, by reason of the physical difficulty of unrolling the tongue from the *r*-position and raising it to that in which the *y* is uttered without too great expenditure of effort and time, it has now become usual to omit the semivowel altogether: all the orthoëpists allow *rude*, for example, to be spoken precisely as if it were written *rood*. A similar physical difficulty experienced in combining the semivowel with the series of dental letters, *t*, *d*, *th*, *s*, *n*, *l* (which also confine the tongue, though less markedly than the *r*, which is spoken farther back in the mouth), gives rise to a modification of the prefix after these letters also, in accented syllables; it is made both briefer and less close, having rather the quality of an *î* than that of an *ī* or *y*. When, however, the preceding consonant is, as it were, lifted off the vowel by an accent upon the syllable just before it, the *yu* is fully uttered; as in *pénury* (*pên-yû-rî*) compared with *penúrious* (*pe-n'û-rî-ēs*). It is, indeed, very common in popular pronunciation, in both England and America, to silence the prefix entirely in an accented syllable after a dental; speaking *penúrious*, for example, as if it were spelt with *oo* in the second syllable.

Of the simple vowels, there remain to be noticed only the pair of neutral vowels, the "short *u*" of *but*, *son*, *blood*, etc., of which I have spoken sufficiently above (see note 2, p. 336), and its corresponding long sound, which appears only before an *r*, and is represented in that position by many of our vowels and digraphs: as in *hurt*, *bird*, *herd*, *heard*, *work*, *journey*, *myrrh*. This latter, like the other long vowels, varies a little in quality as well as in quantity from the short, and in the usual direction; it is a closer sound; the relaxation of the oral organs is more complete, the whole mouth more shut together.

Our diphthongs demand a word of further explanation. We have three of them, in *pine*, *pound*, *point*. The first two are less properly to be called diphthongs than slides: in our "long *i*," as we call it, the tone runs down from the openest *a* to the closest *i*; in *ou*, it makes in like manner the whole descent from *a* to *u*. They are the more distinctly slides, inasmuch as neither the initial nor the final element in them is, as they are ordinarily pronounced, more perceptible than any of the intermediate sounds; hence they differ slightly from the German *ei* (and yet more from *ai*) and *au*, in which the initial element is briefly dwelt upon, and made more prominent than the rest. When they are protracted, as in singing, it is, of course, the *a*-sound with which they commence that receives the increase of quantity. This absence of distinctness of their constituent elements, now, gives them a peculiar likeness to simple sounds: very few, certainly, of those who use them have any idea that they are not homogeneous tones. Moreover, the closure of the mouth-organs by which they are produced is made so easily and rapidly that they hardly require more than the time of a short vowel. With the *oi* of *point* the case is quite different: the *a* with which it begins is made quite distinctly audible, and is even a little dwelt upon, decidedly more so than the initial element in the German *eu* and *äu*, with which diphthongs our own otherwise corresponds as closely as possible.

The systematic presentation of the scheme of English vowels, then, will be as follows—putting, for convenience's sake, the neutral vowels in the center of the triangle, since the *ü* and *ö* sounds are wanting in our alphabet:—



It may be remarked, in conclusion, that, as the long and short vowels in our system differ always in quality as well as in quantity, we do not need, in order to maintain their identity, to be very exact in keeping them of the same length. In the usage of certain individuals, in certain styles of enunciation—even, as some claim, in certain words according to general usage—the short vowels are a little stretched out, the long a little abbreviated; yet not in a way which admits of definition and pre-

scription, or demands more special notice. To attempt to distinguish and mark by special signs more shades of vowel sound than are given in this scheme (with the single possible exception, as explained above, of the *a* of *graft*, etc.) would be, I am persuaded, a work of superfluous and hair-splitting care.

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## *2. On the Relation of Vowels and Consonants.*

The question of the mutual relation of vowels and consonants, of what constitutes the essential distinction of either class from the other, is one of primary interest as regards the theory of the alphabet, and does not appear to me ever to have been taken up and discussed in a wholly satisfactory manner. In my criticism of Prof. Lepsius's Standard Alphabet, to which he has replied in the above letter, I set forth, in a somewhat brief and cursory manner, my own views upon the subject. But inasmuch as they do not seem to have won his assent, and as the exposition of them there given may appear equally unconvincing to others who might possibly be won over by their fuller discussion, I propose in this place to state and defend them anew.

The mode of production of the consonants in general, involving a consideration of the positions taken up by the mouth-organs in uttering them, and the character of the material furnished for them by the lungs and throat, whether intonated or unintonated, is a comparatively easy subject, and is now pretty thoroughly worked out; only a few doubtful and difficult points remaining, concerning the character of certain more rare and exceptional sounds, or concerning what are the essential and what the accidental characteristics of others. The vowels are a more difficult subject, and only the most recent investigations of such men as Willis, Kempelen, Ellis, Helmholtz, Brücke, have been successful in giving us anything like an exact scientific definition of what makes an *a*, an *i*, an *u*, etc., as distinguished from one another; and, approximately, by what physical action they receive their peculiar and characteristic quality. I say approximately, because the differences of position in the mouth-organs by which they are produced are in part so slight, so obscure, and so complicated, that they may for a long time, if not always, continue to elude exact observation. For all present practical purposes, however, so far as concerns the needs of the historical student of language, the comparative philologist, the physical system of sounds may be regarded as, in all its parts, fairly understood.

In all its parts, I cannot but think, better than in its totality as a system. Those who study the spoken alphabet have been content, for the most part, to treat the vowels and consonants as two independent bodies, partners in the work of articulate expression, indissolubly married together for the uses of speech, yet distinct individuals, to be classed, arranged, and described separately, and afterward set side by side. Now it is, certainly, theoretically conceivable that the products of the organs of articulation should be thus of two distinct kinds; just as the human race is composed of two distinct sexes, each having its

own part to play in the work of the race, any true intermediate form or combination of the two being impossible, any apparent one a monstrosity. But is this actually the case in the spoken alphabet? I think decidedly not. The simple fact of the occurrence in our phonological vocabulary of the term "semivowel" is of itself enough to shake such a theory to its foundation. Think of a woman who should be a "seman!" There is, on the one hand, a not inconsiderable class of sounds, known by various names—as semivowels, liquids, nasals—in which, though we generally reckon them as consonants, we recognize a special kindred with the vowels, inasmuch that they even sometimes assume vocalic value: they are especially *l, m, n, r*. On the other hand, there are two vowels, *i* and *u*, which are so closely allied to consonants that, when we put them in the same syllable before another vowel, we can hardly keep them from passing into sounds which we are accustomed to represent by *y* and *w*, regarding them as consonantal, and not vocalic. These are the principal facts which seem to oppose the theory of the independence of vowel and consonant, and compel us to inquire more narrowly into what we are to understand respectively by a vocalic and a consonantal character.

Probably no better and more truly descriptive designation than "consonant" could be found for the class of sounds to which we assign that name. It means 'sounding along with' a letter of the other class, a vowel. By this is not at all intended, however, that a consonant cannot be uttered except in combination with a vowel: every consonant can be so uttered; the semivowels, sibilants, spirants are continuable sounds, not less than the vowels; one may utter an *l*, an *s*, a *v*, or their like, as long as his breath will hold out; and even the mutes may be made distinctly audible by explosion with breath alone, with a mere puff of unarticulated air. The epithet is a historical one, not a theoretical. In the actual usage of language, consonants never do occur independently: no word is composed of consonants alone; a vowel is a necessary constituent of every one of those items of which our vocabulary is made up. The same is true of the lesser articulate entities into which we divide most of our words, namely syllables: every syllable also must contain a vowel, or a sound doing duty as such. Upon this point we must dwell for a time: the distinction of vowel and consonant stands so intimately related with the theory of the syllable, that the latter positively requires at our hands some explanation and definition, in order to the comprehension of the former.

The historical study of language has proved that the syllables composing our present words are, for the most part, elements originally independent, by the combination and fusion of which polysyllabic words were produced. Each such syllable was composed of, or else necessarily contained, a vowel, and after their composition their identity as separate syllables is often still preserved. But in what does this syllabic identity consist? When the separate individuality of the elements is lost so far as meaning is concerned, why is it still phonetically preserved? Why do not the two words become one syllable when they become one word? or why not always, as they do sometimes? What, in short, is the phonetic distinction between a monosyllable and a polysyllable?

None of the definitions of a syllable which I have met with have seemed in all respects accurate and satisfactory. The most usual and current one amounts nearly to this: a syllable is that part of a word which is uttered by a single effort of the voice. Such an account of the matter is not of the slightest value. Just as much is a whole word, a whole sentence, uttered by a single effort of the voice, when the speaker knows what he is going to say, and says it at once in conscious connection. It takes a certain amount of reflection to recognize a word as composed of separate syllables. The untaught speaker, who has not learned to examine and theorize about what he says, utters his word without any thought of analyzing it into parts, without feeling a succession of efforts as necessary to the enunciation of the separate syllables, any more than of the separate letters. Indeed, even upon reflection, it is much more proper to speak of the letters than of the syllables as formed by so many efforts of enunciation. Take, for instance, the word *blend*. It is, as every one perceives, a single syllable; but it is a unity of a very complex composition. In its utterance, the organs of the mouth put themselves in no less than five different positions in succession. First, with the lips closed, a little breath is forced up from the lungs into the closed cavity of the mouth, intonated on its way through the larynx by being made to set the vocal cords in vibration. This lasts but for the briefest moment; before the cavity is so filled as to stop the expulsion, the lips are unclosed, and the *b* is heard. At the same instant, the tongue has been made to touch the roof of the mouth at its tip, while the uninterrupted current of sonant breath streams out at its sides, giving the *l*-sound. Next, the tongue changes its position: its point is released from contact and depressed in the mouth, resting against the lower teeth, its upper flat surface approaches the palate, and the *e* makes itself audible. Once more the tongue shifts place; its tip is again applied as in forming the *l*; but this time no opening is left at the sides; contact along its whole length prohibits all emission of air through the mouth; but the passage from the mouth through the nose, hitherto closed, is thrown open, and the stream finds exit there; and the sound is *n*. And lastly, with no change of place on the part of any of the other organs, the passage into the nose is shut again; the intonated breath is expelled a moment longer into the closed cavity of the mouth, and the syllable is closed with a *d* (which, however, requires, in order to be made distinctly audible, a supplemental unclosure of the organs, though without the utterance of any vowel). All these changes, which it has taken so long to describe, are performed with such rapidity and precision, one position of the organs succeeds another so closely and accurately, that no intermediate transitional sounds are apprehended by the ear during the process: it hears five successive sounds only, forming a syllable. In what true sense, now, can this complicated process be called a single effort of the voice? One element of unity, it is true, there is in the word: from its beginning to its end, there has been an uninterrupted emission of intonated breath through the larynx. But, in the first place, this is not necessary in order to make the unity of a syllable: *strength* is also a single syllable, composed of six different sounds; but the intonation of the breath begins with the third element,

*r*, and continues only through the fourth and fifth, *e* and *ng*; the sixth, *th*, like the two first, *s* and *l*, is produced with breath unintonated. In the second place, unbroken continuity of intonation does not suffice to make the unity of a syllable; the word *navy*, for example, requires but four successive positions of the organs of articulation, and is intonated or sonant from beginning to end, yet it is a word of two syllables. The reason for this is, as we usually say, that it contains two separate vowels. But the words *token*, *able* are also dissyllabic, although they contain but one pronounced "vowel" each: for the *e* in their final syllables is altogether silent; there is nothing after the *k* in the one but an *n*; nothing after the *b* in the other but an *l*. The question to be determined, then, is: What is there in common to these three words which makes them all alike to be reckoned as of two syllables? And the answer, I think, is clearly this: among the four sounds of which each is composed, there are two which are of so much more open position, more sonorous and continuable, than the others with which they are connected, that they make upon the ear the impression of two distinct phonetic impulses, separated and at the same time connected by the closer utterance which intervenes. The distinction of syllables is primarily made, not by the mouth of the speaker, but by the ear of the hearer: the articulating organs are engaged, in the enunciation of any word, long or short, in an unintermitted series of changes of position, from the first letter to the last, and are conscious of no relaxation of effort; the ear apprehends the products of the different positions as so many successive entities, but at once classifies them, arranging them in separate groups, in which the closer sounds are subordinated to the opener. If the word *abracadabra*, for instance, be uttered, while the emission of intonated breath is one and continuous, and while the articulating positions of the mouth-organs are eleven, each giving rise to a separate sound which is distinctly heard, we yet hear five unities, just as if *a* were uttered five times successively, with only a pause, a hiatus, intervening between each two enunciations. So in *endogenously*, or any other like word. The flow of articulated utterance is parted into portions, not only by a complete intermission of utterance, but by that partial check or impediment which is interposed between the opener sounds by the closer ones: and, as the actual hiatus is comparatively infrequent in spoken speech, it is mainly true in practice that the constitution of syllables depends upon the antithesis of opener and closer articulations, the former being their central and necessary constituents, to which the latter are accessories and adjuncts.

Into the details of the construction of syllables, as formed and tolerated in different languages, our present purpose does not require us to enter: these, as every one knows, are very various, depending upon the energy of articulation of the different nations, the degree of effort which they are severally willing to make in enunciation. The Polynesian will not combine more than one closer articulation, or consonant, with each opener articulation, or vowel, which latter, moreover, must always succeed the former; the Englishman, in exceptional cases, and under certain conditions of arrangement, suffers as many as three consonant sounds before the vowel, and four after it, as in *strands*, *splints*, *twelfths*.

Now, in the system of spoken sounds, there are some which are of so close position, so little clear and resonant, that they are never used otherwise than as consonants: that is, they appear in actual speech only as combined in the same syllable with the opener sounds. Such are, above all, the mutes; and the sibilants and spirants are, for the most part, in a like case. We may utter or reiterate a *v*, a *th*, an *s*, an *sh*, as much as we please, but we shall not succeed in making upon any ear the impression of syllables. Again, there are others which are so open that they are always vowels and not consonants: they never occupy the position of adjuncts in the same syllable to a yet opener sound which is apprehended as *the* vowel of the syllable. Such, for instance, are *a*, *e*, *o*. But there is also a not inconsiderable class of sounds which are capable of use with either value. Among those which we usually style vowels, *i* (*ee*) and *u* (*oo*) are of this character. They are, as is well known, the vowels which are produced by near approximation of the same organs in the mouth which are used in forming consonants also: in uttering *u*, there is a pretty close approach of the lips, whose complete closure gives *p* or *b*; in *i*, there is a like approach of those parts of the tongue and palate whose contact generates a *k* or *g*. Hence, accordingly, as we are wont to express it, the readiness with which they pass over into the semivowels *y* and *w*: a transition so common, in so many languages, that it is needless to give any illustrations of it here. And what are these "semivowels?" They are nothing but *i* and *u* themselves, deprived of the quantity and stress which belong to a full vowel utterance. They are not distinguished from those vowels by a difference in the position of the mouth-organs, or in the material emitted from the throat through them. Put *u* and *i* side by side, and whether their combination shall require to be written *ui*, or *wi*, or *uy*, will depend entirely upon the force and time which are allotted to each respectively; if both are struck alike, the product is *ui*, two vowels; if the former be made the principal member of the combination, the other being abbreviated and slighted, the result is *uy*, a vowel and following semivowel; if the reverse, a semivowel and following vowel, *yu*. It is true that we are able to pronounce the combinations *ye* and *woo*, putting before each vowel, audibly, its corresponding semivowel: but in such cases, for the sake of preserving the distinction, we make the semivowels closer than usual, approximating the *y* nearly to a sonant counterpart of the German *ch*-sound in *ich*, the *w* nearly to the German *w*-sound in *quellen*—yet not converting them into these sounds: for if the *y* of *ye* and the *w* of *woo* be prolonged, the *i*- and *u*-sounds will be found distinctly apprehensible in them, even though a little friction of the current of air against the nearly closed organs may also be heard; whereas, in the other sounds, which are true fricative consonants, the proper vocalic character is entirely obliterated by the rubbing of the emitted air against the sides of the orifice through which it finds exit; there is resonance, but no vowel. And in our ordinary pronunciation of *y* and *w* we do not—or we need not, and do not except in special cases, when striving after a peculiarly distinct utterance—attain this higher degree of closeness, but only that corresponding to *i* (*ee*) and *u* (*oo*). It is practicable to pronounce a distinct *y* and

*w* before a vowel with that yet opener position of the mouth-organs in which are formed our short *ɪ* (in *pin*) and our short *ʊ* (in *full*); and even our *e* and *o*, if slighted in the same way before *a*, will make recognizably, though less distinctly, the same impression. To prove, now, that *y* and *w* are not vowels, but consonants, is surely unnecessary: the general consent of alphabetic usage and of the opinions of phonetic theorists is enough to establish their consonantal character. That some nations, as the Latin, have had no peculiar sign for them, but have written them with the signs for *i* and *u*, only proves the economy of their alphabetic systems, and attests the close relation subsisting between these corresponding semivowels and vowels, their virtual identity as articulations.

If the vowels are thus found in part capable of assuming a consonantal value, so, also, some of the consonants are capable of use as vowels. This has already been pointed out and briefly illustrated, and will require but little farther treatment at our hands. The consonants most often employed with vocalic quality are *l*, *n*, *r*. Let us notice the circumstances in which they exhibit their different values.

In our two words *talc* and *tackle* (*tak-l*) we have precisely the same four articulations and articulated sounds, with this difference: in the former word, the *l*-sound precedes the *k*-sound; in the latter, it follows it. But in the one case, *l* is a consonant, and the word is a monosyllable; in the other case, the word is a dissyllable, and *l* is the vowel of its second syllable. How is this further difference the result of the one already pointed out? Clearly enough, it is owing to the position and surroundings of the *l*. *L* is so open and resonant a sound, it has so much of that quality which makes a vowel, which gives a vowel its capacity to stand as the central and essential constituent of a syllable, that it is able to perform the office of a vowel, when put in contrast with a preceding closer sound like *k*. But it is not open enough to maintain a vocalic character when put alongside of the full vowel *a*. The same is the case in the two words *plaid* and *paddle*, which are also made up of identical elements, and differ only in respect to their order. An *l* either before or after an *a* is, by contrast with it, a close sound, consonantal; the ear recognizes the *a* alone as the vowel of the syllable which contains them both; but in combination with the preceding close *k* or *d*, and not followed by any opener sound, it is itself open enough to make the impression of a syllable; it is vocalic. In our previous example, *blend*, there is a regular *crescendo-diminuendo* scale of openness: we begin with the contact-letter *b*, open a little to the *l*, and yet more to the *e*, then close partially in the *n*, and end with the contact-letter *d*. The whole is but one syllable, and furnishes us an illustration of the normal way in which a complex syllable is made up. Change the position of either *l* or *n*, so that they are separated from the full vowel *e* by a sound closer than they themselves are, and we obtain either such combinations as *lbend* or *nbled*—which, though not absolutely unpronounceable, are rejected in practical use as too harsh and difficult—or words of two syllables, *bledn* (like *deaden*) or *bendl* (like *bundle*). In the Lepsian orthographical system, an *l* or *n*, or any other consonant, when thus used with a vowel value, is written with a

diacritical point, a little circle beneath; and it is altogether proper to do so; the difference in the office is sufficient to make such a difference in the sign desirable. Only we must be careful not to commit the error of supposing that there is any articulate distinction between the two sounds, any element present in the *l*-vowel, for example, which is wanting in the consonant *l*: the distinction is only, like that of *i* and *y*, *u* and *w*, one of quantity and stress of utterance.

To illustrate the use of *r* as vowel in like manner, out of our own language, is not easy; there are too many controverted points concerning the pronunciation of our *r*, in the detailed discussion of which the attempt at illustration would involve us. In my own opinion, the *r* by itself is not employed by us as a vowel; the neutral vowel almost always comes in either to accompany or to replace it. But in other tongues, the *r* is used as a vowel with much more freedom than is either *l* or *n* in any known form of human speech. The Sanskrit furnishes the readiest exemplification of this use. In Sanskrit, the *r* is a vowel which may stand anywhere: it is not restricted, like *l* or *n* with us, to an unaccented syllable, following accented syllables in the same word, that contain full vowels: it receives the accent, as in *karmakr't*; it is the sole vowel of a monosyllable, as in *hrd*; it forms an initial syllable, as in *rtû*. It is, to be sure, truly regarded as everywhere the historical descendant and representative of a full vowel joined with a semivowel *r*, of an *ar* or *ra*, but that is not material to the point of our present discussion. So our vocalic *l* and *n* are only relics of former syllables containing vowels; and there is doubtless no good reason for believing that any of the "semivowels" or "liquids" has ever come to do duty as a vowel in other than a like way. We are inquiring in virtue of what qualities they do actually come to be called on to perform such duty, while the mutes, as *b*, *d*, *g*, and the spirants, as *v*, *th*, *γ*, are never treated in the same manner.

It must, however, be further noticed that the consonants which we have been considering are not necessarily and inevitably pronounced as vowels, even in the favoring situations where we have seen them assume this character. As in the case of *i* and *u*, a certain degree of stress and quantity is required to make vowels of them. They may be, even after a close letter, so abbreviated and slighted, so subordinated to the preceding syllable, as to form to the ear only a harsh and difficult appendage to that syllable. This is their treatment in French, in the prose pronunciation of such words as *sabre*, *table*, where the "mute *e*" is really mute, and the words are monosyllables. It is usual, indeed, to half or quite whisper the *r* or *l* in such situations, especially when the preceding mute is a surd, as in *lettre*, *miracle*. Their vocalic quality, then, amounts simply to this: that they are capable of receiving, and under certain circumstances do receive, in many languages, without any change of articulate quality, the full office of a vowel in forming syllables.

A higher grade of vocalic capacity belongs to *r* and *l* than to any other of the sounds usually reckoned as consonantal, in virtue of the more open position assumed by the mouth-organs in their utterance, which gives them a share in the sonorousness and continuability characteristic of the vowels. A next lower degree is shared by the nasals,

which derive a like quality from the openness of the nasal passage, even though the mouth is shut while they are spoken. How *n* is used as vowel in English has been already illustrated. There would seem to be no reason in the nature of things why the other nasals, *m* and *ng*, should not be treated in the same way; yet I am not aware that, in English or elsewhere, they are allowed to stand as the vowel of a syllable. In our vulgar colloquial *yes'm*, indeed, for *yes ma'am*, we have a single actual, though a disallowed, instance of *m* as a vowel, which is just enough to show the possibility of so employing it. The difficulty in the way is a historical rather than a theoretical one: *elm*, *rhythm*, *chasm*, *schism* are representatives of considerable classes of English words, but in none of them has the *m* inherited a title to syllabic value, by being the phonetic remnant of an English syllable that once contained a vowel before the *m*; accordingly, while illiterate speakers not seldom make of the *m* an additional syllable, we who are instructed accustom ourselves to force it into combination with the preceding consonants, as the French treat their *r* and *l* in the words cited above. This is the easier, inasmuch as, on the one hand, the *m* never so occurs after mutes, but only after partially open letters; and as, on the other hand, we have reached in the nasals the lowest degree of vocalic capacity. There are words—of which *heaven* is the most familiar instance—in which, after a fricative, even *n* is treated by us sometimes as a separate syllable, and sometimes as a part of the preceding syllable.

In the class of sounds of the next degree of closure, the sibilants, the line which separates the possibly vocalic from the invariably consonantal is already passed. The sibilants are letters whose mode of formation allows of their easy and frequent prefixion and affixion to other consonants, of every class, while yet they are too little open and sonorous to make upon the ear the impression of a syllable, even when separated from a vowel by full contact-letters. Thus, in *tacks*, *adze*, *eggs*, *stain*, *skein*, *such* (*sut-sh*), *budge* (*bud-zh*), whatever force and quantity we may give the hissing sound, we feel no impulse to recognize in it a vowel quality, and to estimate the words as dissyllables. The *l* of *draggled* is just as distinctly a vowel as the *e* of *draggeth*, but nothing that we can do will confer the same value on the *s* of *thou drag'st*, though its position, between two mutes, is the most favorable that can be devised for the development of vocalic capacity.\* As for the closer spirants, *v*, *th*, *γ*, they exhibit no trace whatever of any such capacity.

If, then, certain of the vowels need only to be abbreviated in utterance in order to take on a consonantal character, and if certain of the consonants are capable of performing, under favoring circumstances, the most essential and distinctive office of the vowels, I see not how it can be claimed with justice that vowels and consonants are two separate and independent systems of articulate sounds, the combinations of which produce words, or even two absolute divisions of the general alphabetical system, to be treated apart, and arranged and classified

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\* Yet, by a remarkable exception, it is claimed that in two Chinese words, *sz* and *tsz*, the *z* is obliged to perform the part of a vowel. See Lepsius's *Standard Alphabet* (second edition), p. 48, note.

without reference to each other. It seems necessary to find some definition of vowel and consonant which shall take due account of and explain these facts, and some mode of arrangement of the alphabet which shall exhibit the relations they imply.

To the same conclusion we are led by a consideration of the insufficiency of the definitions ordinarily given by phonologists of these two classes of sounds. To Prof. Max Müller, for instance (Lectures, second series, third lecture; p. 139 of the American edition), while all vowels are tones, all consonants are mere noises. Of the latter he speaks as follows: "All consonants fall under the category of noises. If we watch any musical instruments, we can easily perceive that their sounds are always preceded by certain noises, arising from the first impulses imparted to the air before it can produce really musical sensations. We hear the puffing and panting of the siren, the scratching of the violin, the hammering of the piano-forte, the spitting of the flute. The same in speaking. If we send out our breath, whether vocalized or not, we hear the rushing out, the momentary breathing, the impulse produced by the inner air as it reaches the outer."

This exposition possesses no more than the semblance of a meaning, if even that; it is worth nothing as affording an explanation of the character of a consonant, or even as helping us better to realize that character. To compare consonants, those essential and highly characteristic parts of our articulated speech, with the unmusical noises of musical instruments, made more or less conspicuous according to the skill of the player, and overborne and silenced altogether in good musical execution, is palpably futile. What is there in the *b* and *l*, the *n* and *d*, of *blend*, for instance, to assimilate them to such noises? Are they, or any other of the twenty or thirty consonants which may gather in groups, even to the number of five or six, about each one of the vowels, in the least degree dependent for their being on the latter, or generated by it? Is not each one as distinct a product of the voluntary action of the articulating organs, consciously directed to its production, as is any vowel? Is there any difficulty in uttering a clear vowel, free from such prefatory or sequent appendages? And are those sounds entitled to the appellation of noises only, as distinguished from tones, which can themselves be musically intoned? There is not a sonant consonant in the system to which a tune cannot be sung, without help from vowels; we are in the constant habit of "humming" a melody, as we call it, which is only singing it to a prolonged *m*; and an *l* or an *r* may be hardly less easily sung, and with hardly more perceptible friction of the escaping air against the mouth organs, than an *i* or an *u*. The asserted analogy fails of application in every particular.

I have already expressed my regret that Prof. Lepsius has not taken occasion, either in his Standard Alphabet or in his letter respecting it, to give his own view of what makes consonants and what vowels, and why they are to be regarded as forming independent systems. He would unquestionably have given us something far better than the unmeaning comparison cited above. Yet I must confess my inability to see how he would have set about furnishing a solid foundation to his opinion. We may conjecture that he would have put forth some such

definition of a consonant as that furnished by Dr. Brücke (in his *Grundzüge der Physiologie und Systematik der Sprachlaute*, Wien, 1856, at p. 29). No phonetic investigator of the present time is entitled to more respect and confidence than this gentleman, nor should we naturally look for a satisfactory determination of the matter here in question from any other sooner than from him. His account of it is as follows: "In all consonants, there takes place somewhere in the mouth-canal a closure, or a contraction which gives rise to a plainly audible and self-subsistent rustling, which is independent of the tone of the voice; while in the vowels neither of these two things is the case."

To the correctness of this statement less exception is to be taken than to its character as a sufficient definition. It appears to me hardly to possess a right to be regarded as a definition: it is rather a specification—a specification of the two principal sub-classes into which consonants are divided, and a description of their respective characteristics. Some consonants, it declares, are formed by a complete closure of the mouth-organs, others by such an approximation of them as produces an audible rustling. This specification, however, does not appear quite exhaustive. In the sub-class produced by closure are included sounds as different as mutes and nasals (or "resonants," as Dr. Brücke, with much reason, prefers to call them); the latter implying, indeed, a closure of the mouth, but combining with this an unclosure of the nasal passages, in such wise as to give a very different character as consonants to the sounds produced. It might have been better, then, to specify the three sub-classes of mutes, fricatives, and resonants, as joint constituents of the class of consonants. And our account of the alphabetic system would be of this sort: sounds possessing such and such and such characteristics, of three kinds, are consonants; the rest, not possessing any of them, are vowels. Is not this a superficial account of the matter? Does it give us any common characteristic as belonging to our consonantal subdivisions, combining them into a class together, and distinguishing them from the vowels? Why do we set up the vowels as a distinct grand division of the alphabet, and not as well, for instance, the mutes; saying, The alphabet is divided into mutes and non-mutes; the non-mutes being continuable sounds, and accompanied with the expulsion of breath, through either the lips or the nose; the mutes implying the closure of both, and being explosive only? If it be replied, that the distinction of vowels and consonants is shown by universal linguistic usage to be one of primary and fundamental consequence, the construction of an important phonetic unity, the syllable, depending upon it, we should retort by alleging the difficulties already shown to beset the distinction of the two classes upon this basis: that *i* and *u*, vowels, are convertible into *y* and *w*, consonants; that *r*, *l*, *n*, and so on, are sometimes vowels, and not consonants. We might even claim it as questionable whether *l*, and *r* when untrilled, are full fricatives; whether they do not come quite as near to being tone-letters, like the vowels, as letters whose essential element is a rustling, such as is plainly and incontrovertibly heard in *z* and *s*, in *v* and *f*. Out of which of all these difficulties are we helped by Dr. Brücke's definition of a consonant?

It seems to me evident that, in order to avoid such difficulties, we need a definition of a consonant, a determination of its relation to a vowel, of a different character from any heretofore given. We do not need to supersede or alter any of the definitions of single sounds, or even of the principal groups of sounds, already prevailing: we only want to find the tie which unites these into more comprehensive classes, and the principle on which the whole alphabet of articulated products may be arranged as a single system, with the connection of its parts duly set forth. Nor can I think the principle difficult to find, nor, when found, of doubtful application.

This needed principle is the antithesis of material and form, the respective part played in the production of the different alphabetic sounds by the organs of the lungs and throat, which produce the vibrating column of air, the tone or breath, and by the organs of the mouth, which modify this tone, giving it various individuality. The different groups have their limits determined by the different degree of action of the mouth-organs upon the throat-product—in other words, by the different degree of closure of the former. If the throat-product be given forth with all the freedom and purity of which it is capable, the mouth being set wide open, so that none of its parts stand in the way of the sonant expiration otherwise than as our physical structure renders unavoidably necessary, the tone produced is *a* (in *far*). This is the true description of *a* as a constituent of the spoken alphabet: *a* is the simplest and purest tone-sound which, in virtue of its peculiar structure, the human throat brings forth. To determine the fundamental and secondary vibrations which give to *a* its acoustic character, to ascertain the length of pipe, or the degree of official closure, needful to generate it when the tones of the human throat are imitated by means of artificial constructions—these and other like investigations have, it is true, a high theoretic interest, while yet, in their bearing upon linguistic phonology, they are only of subordinate consequence: sounds are produced for the purposes of human speech by the voluntary efforts of human organs, and are to be estimated and classified according to those efforts.

If, now, we go on to modify this pure sound by the action of the mouth-organs, we find at once that we can and do produce certain series of related sounds by different degrees of the same kind of modification. When, for instance, after pronouncing *a*, we round and protrude the lips a very little, the sound becomes *ä* (in *all*, *awe*). By rounding them a little more closely, we convert the tone into *o*; and if the approximation is made quite a near one, we give utterance to an *u* (in *rule*, *fool*). There is really an infinite number of sounds intermediate between *a* and *u*, made by infinitely varying degrees of approximation of the lips (not, perhaps, without auxiliary motions at the back part of the mouth, the orifice of the throat—at least it is possible to make tolerable imitations of these vowels by tongue-motions alone, the lips remaining unchanged in position—but these are of secondary importance, concomitants and consequences of the lip action, which alone is consciously performed); and some of these infinite possibilities become realized in the varying utterance, in different languages or within the

limits of the same language, of the three we have noticed; yet the latter constitute practically the series of "labial vowels"—as they are denominated, from the organs principally instrumental in their production. The *u* is the closest tone-sound which we can make by labial approximation; however closely we may press the lips toward one another, the vowel generated is still *u*, until they actually touch, when, if their contact be made so loosely that we can still force out the intonated breath between them, we utter a *v*—a *v*, it is true, of a somewhat different kind from our common one, in pronouncing which we press the upper teeth upon the lower lips, but one which is only slightly distinguished from this, and which is found in German, for instance, as a regular constituent of the spoken alphabet. In this sound, the tone or throat-product is no longer the main audible element; but, rather, the friction of the escaping column of intonated air against the edges of the obstacles that so nearly confine it: the form has become more important than the material. So decidedly is this the case that, even if the tone be altogether withdrawn, and mere unintonated breath expelled, the friction is still distinctly audible, sufficiently so to be capable of use in spoken language, as one of the products of the articulating organs: we call it the letter *f*. It was not so with the vowels *a*, *g*, *o*, *u*: expulsion of unintonated breath through the four apertures of the mouth-organs by which these were uttered did not give four employable articulate sounds; it gave only a single uncharacterized aspiration, or breathing. But the labial interference may be carried one step farther, to complete closure; then, of course, there is no longer any expulsion of breath; there is neither tone nor friction to make a perceptible sound; there is silence: sound is produced only as the contact is broken, and a fricative or tone-sound follows: but the breach itself forms an appreciable element of articulation, and we reckon it as a *p*; or as a *b*, if it be momentarily preceded by an extrusion of intonated breath from the throat into the closed cavity of the mouth.

Here, at last, we have evidently reached the limit of possible modifying action of the labial organs of the mouth upon the pure tone or throat-product. By their gradually increased interference we have obtained the series of sounds *a*, *g*, *o*, *u*, *v-f*, *b-p*. It may be called the labial series.

Another similar series is produced by the gradual approximation of other organs, at another point in the mouth. If, from the position in which *a* is uttered, the upper flat surface of the middle part of the tongue be slightly raised toward the roof the mouth, in its highest portion and farther back, successive degrees of elevation and approach will give us the vowels *a* (in *fat*), *e* (in *they*), *i* (in *pique*). The accompanying closure of the jaws and lips is here absolutely unessential, and does not contribute to the characterization of the sounds; it is made merely for the convenience of the tongue, helping its access to the palate. The closest sound with predominating tone producible by this method is *i*; a next further degree of approximation gives birth to a pair of fricatives, the German *ch* in *ich*, *pech*, etc., and its corresponding in-tonate, which is a very rare alphabetic constituent: Prof. Lepsius writes them with *χ* and *γ*. Then follow, by complete closure, the into-

nated and unintonated mutes *g* and *k*. Thus we have a series which we may call palatal, composed of *a*, *g*, *e*, *i*, *γ*-*z*, *g*-*k*.

Now I maintain that these two are real series throughout, and that no schematic arrangement of the alphabet can be accepted as complete which does not represent them as such. They are wont to be so presented, as far as to the limits *u* and *i* respectively, in the now well-known vowel-triangle or pyramid. But why stop at these limits? As regards their articulation, there is no greater difference between *i* and *γ*, between *u* and *v*, than between *i* and *e*, *u* and *o*; not so great as between either *i* or *u* and *a*. It is true that the vowel-pyramid faithfully represents a fact, and one of prime consequence in phonology and in linguistic history. But this is not the only fact that we have to regard in laying out the system of spoken sounds. It is true that, in passing from *i* to *γ*, or from *u* to *v*, we have to cross an important and well-marked division line. But it is not on that account anything more than a division line in a series, like the equally well-marked line which parts the classes of fricative sounds from the mutes. It is a line representing the undeniable truth that, with the same organs, approximation short of a certain degree produces vowels, and beyond a certain degree produces consonants—and this is not less a conjunctive than a disjunctive difference; while it holds the two classes apart, it at the same time binds them together into one system. The vowels are the opener sounds in the system, of varying degrees of openness, yet all showing a preponderance of tone over its modification, of material over form: the consonants are the closer sounds in the system; also of varying degrees of closeness, and thereby divided into classes; but all of them sounds of the mouth-organs rather than of the throat, the modification or form prevailing in them over the material. Vowels and consonants, then, are the opposite poles of a series; not divided and dissimilar kinds of sounds, but passing into one another, and separated by a border-land of doubtful belongings.

Besides the two series, composed of vowels and consonants, which have already been described in detail, the ordinary alphabets contain another, including consonants only. It is produced by the tip of the tongue, seeking approach and contact with the roof of the mouth in its forward part. If the tongue be turned upward at its point, and brought toward the parts at or behind the upper front gums, no series of gradually changing tone-sounds is brought forth: the only vowel heard is the neutral vowel (*u* in *burn*), until the approximation of the organs is close enough to generate the *r*—which, as has been explained above (note 8, p. 341), may be either trilled or left smooth. The next degree of approach, at the same place and with the same organs, gives rise to a fricative sound, a *z* (or, if far enough back in the mouth, a *zh*), in which the friction or buzzing is very conspicuous, and which has, like *v* and *γ*, its unintonated counterpart, *s*. One more degree of closure gives a complete stoppage of the voice, and produces the pair of sounds *d* and *t*, full mutes, like *g* and *k*, *b* and *p*. By a peculiar condition of things, now, while the tip of the tongue generates no vowels, it generates two different sounds of its own openest class: namely, the *r*, produced by an opening of a certain aperture between itself and the roof

of the mouth, and an *l*, produced by a closure at the tip and an opening at the sides of the tongue. The ready convertibility of these two sounds, *r* and *l*, in the history of language, is a well-known fact, nor would any one think of putting them into different classes. Though not vowels, they are also not properly fricatives: they are the openest, most resonant, and most continuable, of all the consonantal sounds; they have not, like the sonant fricatives and mutes, their surd counterparts, employable with equal frequency and freedom for the uses of articulate speech. Whether, in their production, the part taken by the throat or by the mouth-organs should be regarded as predominant, seems to me a debatable question: I should not dare to say with confidence whether there is in them more tone or more form. No name is so applicable to them as that of *semivowels*, by which they are also most frequently called: they do, in fact, stand as nearly as possible upon the line of division between vowels and consonants. Hence their capacity of employment as vowels, and their frequent use in that character, as has been sufficiently pointed out above.

There is another important class of sounds, the nasals, whose relations to the other classes, and consequent position in the alphabetic system, require a few words of explanation. As regards the position assumed by the mouth-organs in their utterance, they stand upon the footing of full mutes, the closure of the oral passage being complete. They are far, however, from being mute sounds, because in pronouncing them the nasal passages are opened, and this circumstance gives them no small degree of openness, resonance, and continuability. They constitute, then, a peculiar class, and their place in the scheme of articulate sounds is not to be determined by the position of the mouth-organs only—which would rank them with the mutes—but by their general character. And this evidently places them next the semivowels, before the fricatives; since, as we have already seen, they are capable of employment with the value of vowels, and at least one of them, *n*, is frequently so employed in our language. The same position is assigned them by their incapacity to admit a surd counterpart, by their common relation to the aspiration, the letter *h*. The place and value of this letter in the general alphabet offer an important confirmation of the truth of our method of arranging and classifying the alphabetic sounds. The mutes and fricatives, as we have seen, go in pairs; each sonant letter, produced by an expulsion of intonated breath with the given position of the mouth-organs, has its double, produced by an expulsion of unintonated breath with the same position. In these two classes of sounds, the approximation of the parts of the mouth is sufficient to give a completely individual character even to an emission of air, without tone: they are so far from being tone-sounds, the element of form in them so predominates over that of material, that the material may be changed by the total withdrawal of tone, and what is left is just as much an articulate sound as it was before. An *f* has fully as much right in the alphabet as a *v*, an *s* as a *z*, a *k* as a *g*. This is not the case as regards the other three classes of sounds, the vowels, semivowels, and nasals. An expulsion of mere breath through the three positions, for instance, in which *a*, *i*, *u* are uttered, produces, it is true, three different sounds, which are

readily to be distinguished from one another by one who listens and compares them; and yet, the three are not different enough, do not possess sufficient individuality, to have practical value as three sounds for the usages of speech; they count together for but a single articulation, namely the breathing or aspiration, represented by the letter *h*. The *h* is thus an anomalous member of the alphabet. Every other letter represents a distinct position of the organs of the mouth, through which alone it can be uttered; the *h* has no position of its own, but is uttered in that of the following letter. When we say *ha*, there is no shifting of place of the mouth-organs, as we pass from the former to the latter sound; there is merely first an expiration of breath, then of sound, through the open throat. So also when we pronounce *he* or *who*; the position of the tongue by which *i* is uttered, or that of the lips by which *u* is uttered, in those two words respectively, is taken up before the utterance of the *h*, not after it; there is again only a change from breath to sound as the material employed, no change as regards the oral modification to which the material is subjected. In whispering the same syllables, the aspiration is distinguished from the whispered vowels by a like difference of material, by a free emission of air through the relaxed vocal cords, which in the vowel are strained up nearly to the point of sonant vibration. *H*, then, has its place in the alphabet as the common surd of all those sonant letters which are too open to have each its own individual surd. And such are not the vowels only, but also the semivowels and the nasals. We do not in English, it is true, use an aspiration corresponding to all the semivowels and nasals, but we easily can do so, and such aspirations are not unusual in other tongues. We put *h* freely before every vowel, pronouncing it always through the position of the vowel; we also use it before the semivowels *w* and *y*, as in *when* (*hwen*) and *hue* (*hyu*)—where, indeed, it is not perceptibly different from the *h* of *who* (*hu*) and *he* (*hi*); and farther, before *m*, in the interjection *hm!*\* but no word in our language, so far as I am aware, exhibits the combination of *h* with *l* or *r*.

But it is a farther corollary from our arrangement of the alphabetic system that, the closer the sound, the farther its place from the vowel beginning of the alphabet and toward the mute ending, so much the more distinctly characterized will its corresponding aspiration be, so much the nearer will it come to possessing an independent value and availability. The *h* of *hue* verges very closely upon the German palatal *ch*-sound, in *sich*, *sicher*, etc.; the *h* of *when* is but little removed from an *f* (such as is formed by the lips alone). There are phonetists who maintain that in *when*, as in all other words of the same class, the *w*-sound that originally followed the aspiration (for the etymological history of the words, and the Anglo-Saxon spelling *hw*, leave no room for question by any person that they once began with a semivowel and preceding aspiration) has now become lost, and that only the breathing remains—a breathing of which the character is determined by the for-

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\* A friend reminds me that some persons are in the habit of using *hm!* instead of *hm!* as “the inarticulate symbol of a sneer,” and that young children, learning to speak, often say *hnow*, *hmake*, for *snow*, *snake*, etc.

merly uttered *w*, and which is therefore, in fact, a surd corresponding to the sonant *w*. If this be so, we have in our spoken alphabet a semi-vocalic aspiration which cannot be properly represented by the indifferent letter *h*, but has acquired an independent *status*, and demands an independent sign. That such a thing is phonetically possible no one could presume to deny; for, in the semivowels, we have arrived at a degree of closure of the organs which gives even to the surd utterances a much more distinctly differentiated quality than belongs to the aspirations of the opener vowels; and we might expect to see them appearing sporadically as elements of articulated utterance, even divorced from the sounds which originally called them out. Thus, the de-intonated *r* and *l* of the French words *lettre* and *miracle* and their like, already referred to, are plainly *r* and *l* still, and not breathings merely. And at least one language, the Welsh, has raised a surd *l* to the rank of an independent constituent of the alphabet, by a withdrawal from the *l*, in certain situations, of the intonation which formerly belonged to it. As a matter of fact, however, I am fully convinced that in the class of words now under discussion we do actually pronounce the *w* after its aspiration, and that those who maintain the contrary wrongly apprehend and describe their own utterance. The English spoken alphabet, accordingly, does not possess that rare anomaly, a surd semivowel; its sounds written with *h* in *when* and *hue*, though different in articulation, have no more title to be treated as separate elements, and marked with separate signs, than have the differently articulated breathings represented by *h* in *harp*, *hoop*, and *heap*. *H* is, in English usage, merely the corresponding surd to the vowels, semivowels, and nasals, and its relation to them helps to fix the place of the nasals as next after that of the semivowels in the systematic arrangement of the whole alphabet.

The sounds of which we have treated will, then, when arranged according to their physical character and relations, form the following scheme:

Sonant.	{				<i>a</i>						} Vowels.
					<i>a<sub>e</sub></i>		<i>a<sub>o</sub></i>				
				<i>i</i>	<i>e</i>		<i>o</i>		<i>u</i>		
		<i>ñ</i>	<i>y</i>			<i>r, l</i>		<i>w</i>			
					<i>n</i>				<i>m</i>		Semivowels.
											Nasals.
Surd.		<i>h</i>									Aspiration.
Sonant.		<i>γ</i>			<i>z</i>				<i>v</i>	} Fricatives.	
Surd.		<i>χ</i>			<i>s</i>			<i>f</i>			
Sonant.		<i>g</i>			<i>d</i>				<i>b</i>	} Mutes.	
Surd.		<i>k</i>			<i>t</i>			<i>p</i>			
		Palatal Series.			Lingual Series.				Labial Series.		

I firmly believe that such a scheme exhibits more of the relations, both physical and historical, of the alphabetic sounds, and exhibits them more truly, than any other which can be given, and that by it the spoken alphabets of different languages may be most advantageously

compared and judged. In my former article (*Journ. Am. Or. Soc.*, vii. 324) I have given, upon the same plan, a fuller system, embracing all the consonantal sounds which compose the English alphabet.

Our conclusions may be thus summed up. The fully open *a*, on the one hand, and, on the other hand, the absolutely close and silent consonants *k*, *t*, *p*, are the natural and necessary limits between which the sounds of the alphabet are to be arranged, and arranged in order, according as, in their grade of closeness of the modifying mouth-organs, they more nearly approach the one or the other limit. The opener sounds, in which the tone or material predominates, are called vowels; the closer sounds, in which the modification or form predominates, are called consonants. But this distinction, although the construction of the syllable gives to it a higher practical importance than belongs to any other in the alphabetic system, is not an absolute one: while there are sounds which are and can be nothing but vowels, and others which are and can be nothing but consonants, there are also, on the line between the two classes, some which may have either value, according to their situation. Consonant is a comprehensive name, including at least four different classes of sounds, each capable of exact definition;\* but no admissible definition of a consonant is to be set up save the one just given—that it is a closer sound than a vowel. Vowel and consonant are the two opposite poles of a series, in which are included all the articulate sounds ordinarily employed by human beings for the purposes of speech.

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\* And, in a fuller scheme, like that referred to above, it may be found convenient to divide the class of fricatives into sibilants and spirants.